

Asthma Hospitalizations: Patients Hospitalized Due to Asthma The Burden of Asthma in Indiana (Second Edition): Supplement One

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The hospital discharge data the Indiana State Department of Health (ISDH) receives from the Indiana Hospital Association does not include patient identifiers. Therefore, hospitalization data reported in *The Burden of Asthma in Indiana: Second Edition, March 2008 (Burden Report)* are based on the number of discharge events, not patients.

According to the Burden Report there were 8,302 hospitalizations due to a principal diagnosis of asthma in 2005. Adults, aged 18 years and older, accounted for 6,225 (75%) of the hospitalizations. Children, aged 17 years and younger, accounted for 2,077 (25%) of the hospitalizations. Additional analysis of the data can be viewed in the Burden Report available online at http://www.in.gov/isdh/files/Final_3-13-08.pdf.

Methodology

To obtain information on patients, not the discharge events, a method was developed after reviewing hospitalization data in SAS and some assumptions were made. The assumption was made that if two or more discharge events had the same date-of-birth, sex, race and ZIP Code, the probability that information belonged to the same patient would be very high. Other assumptions included:

- Patients' ZIP Code did not change during the 2005 calendar year; and
- The race of the patients was recorded the same if they were hospitalized more than once.

A method was developed in the SAS Enterprise Guide software to calculate the number of hospitalizations with the same date-of-birth, sex, race and ZIP Code.

The age was calculated based on the date of hospitalizations in the SAS data set. If patients were hospitalized more than once, they could potentially show two different ages if their birthday fell between hospitalization dates. This occurrence made an error in calculation of age frequencies and other analysis involving age and age groups. To fix this issue, the age of people with asthma was calculated from the midpoint of the year 2005 (July 1, 2005) instead of the discharge date. By applying this method, the maximum interval of the age would be $\pm \frac{1}{2}$ year (six months).

Data Limitations

For more information on the data limitations specific to hospital discharge data, go to the Burden Report (Appendix A, page 68 and 69). The report is available online at www.in.gov/isdh/files/Final_3-13-08.pdf.

Patients Hospitalized Due to Asthma

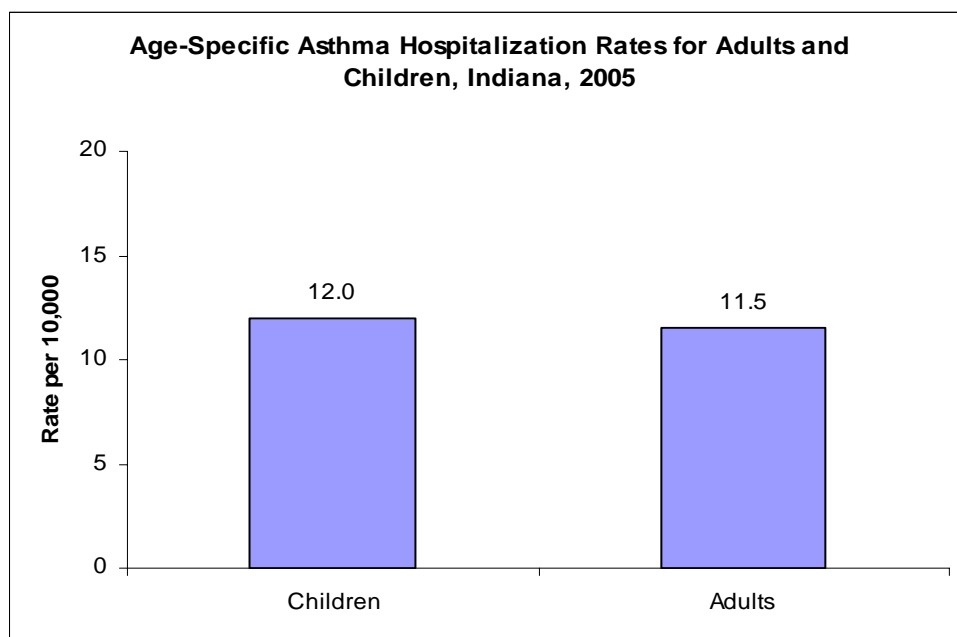
An estimated 7,293 patients were associated with the 8,302 hospitalizations in 2005. Of these patients hospitalized due to asthma, more females and adults (18 years and older) were hospitalized than males and children (17 years and younger). See Table-1.

Table-1: Number and Percent of Patients Hospitalized Due to Asthma by Sex and Age Indiana, 2005

Patients	Frequency	%
Females	4,721	64.7
Males	2,572	35.3
Adults (18+)	5,374	73.7
Children (0-17)	1,919	26.3
Total	7,293	

When comparing asthma hospitalization rates, there was a difference by sex, but not between adults and children. The age-adjusted rate for females was 14.3 per 10,000 and 8.5 per 10,000 for males. Age-specific asthma hospitalization rates for adults and children were similar. See Chart-1.

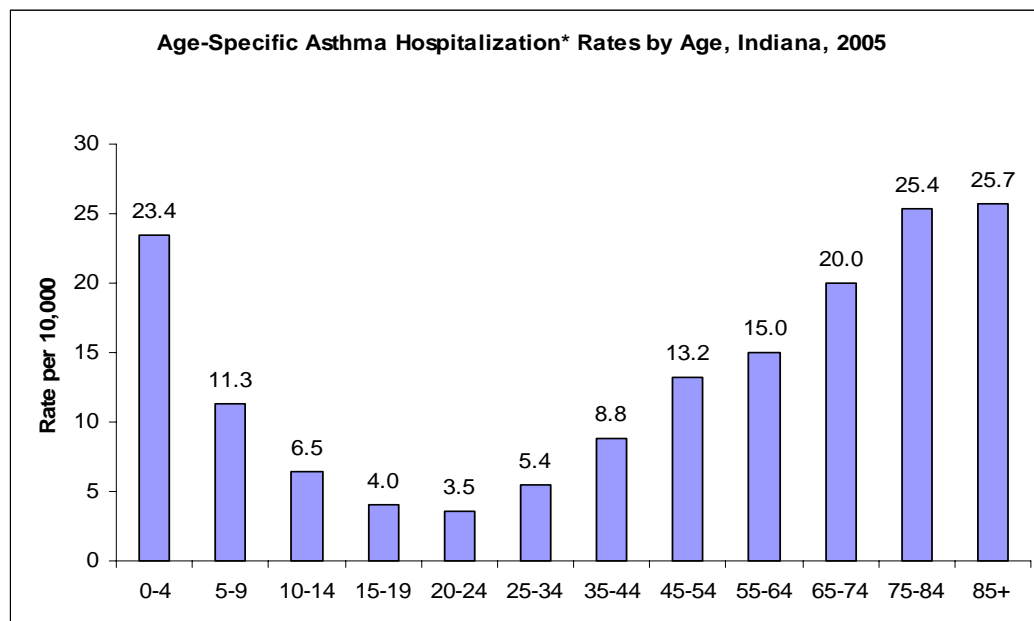
Chart-1



* Hospitalization rates equaled the number of unique patients identified per 10,000 Indiana population.

The rates of people hospitalized due to asthma differed by age group. Adults aged 85 years and older had the highest hospitalization rate (25.7 per 10,000). But this rate was only slightly higher than the next two highest rates for adults aged 75-84 (25.4 per 10,000) and children aged 0-4 (23.4 per 10,000). See Chart-2. As children grew older, the asthma hospitalization rates decreased; starting at ages 25-34 and older, the asthma hospitalization rates increased.

Chart -2



*Hospitalization rates equaled the number of unique patients identified per 10,000 Indiana population.

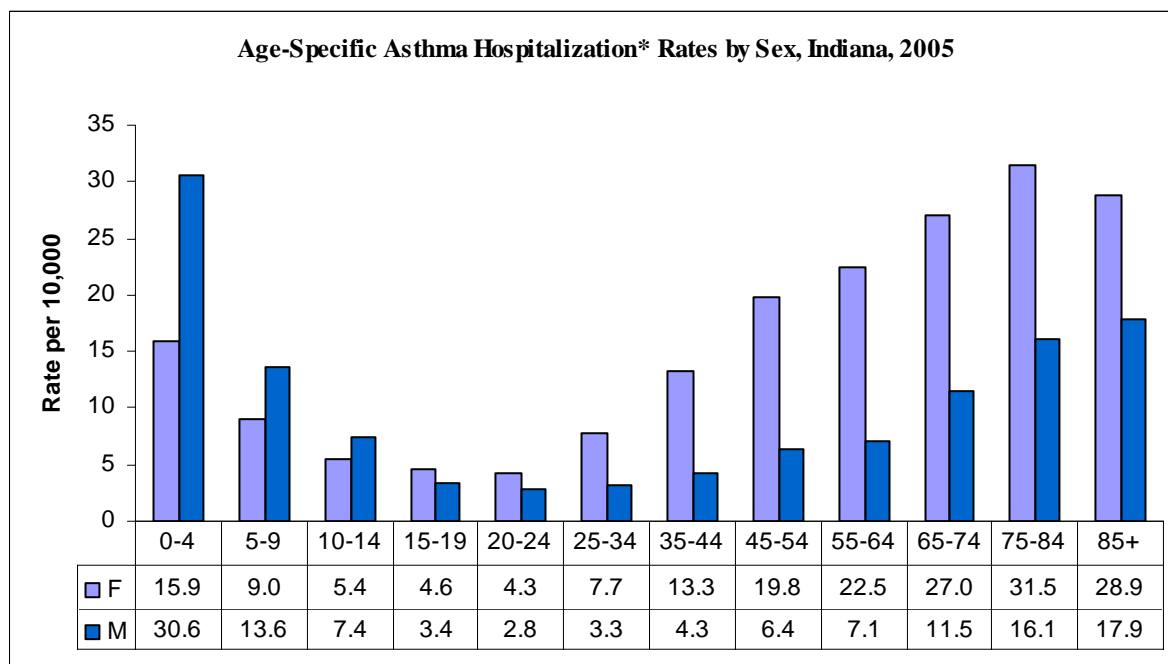
More male than female patients between the ages of 0-14 were hospitalized due to asthma. See Table-2. Beginning with the 15-19 age group, more females than males were hospitalized due to asthma. Females were hospitalized two to three times more than males as they aged. See Table-2.

**Table-2: Number of Patients Hospitalized Due to Asthma by Sex and Age
Indiana, 2005**

Age	Female	Male	Total
0-4	335	673	1,008
5-9	192	304	496
10-14	121	175	296
15-19	102	78	180
20-24	94	64	158
25-34	316	139	455
35-44	595	194	789
45-54	900	287	1,187
55-64	739	218	957
65-74	575	203	778
75-84	530	180	710
85+	222	57	279
Total	4,721	2,572	7,293

Age- and sex-specific rates for females and males hospitalized due to asthma demonstrated the same trend as did the number of female and male patients hospitalized. See Chart-3. The age- and sex-specific hospitalization rates were higher for males than females in the 0-14 age groups. Beginning with the 15-19 age group, the rate was higher for females than males.

Chart-3



*Hospitalization rates equaled the number of unique patients identified per 10,000 Indiana population.

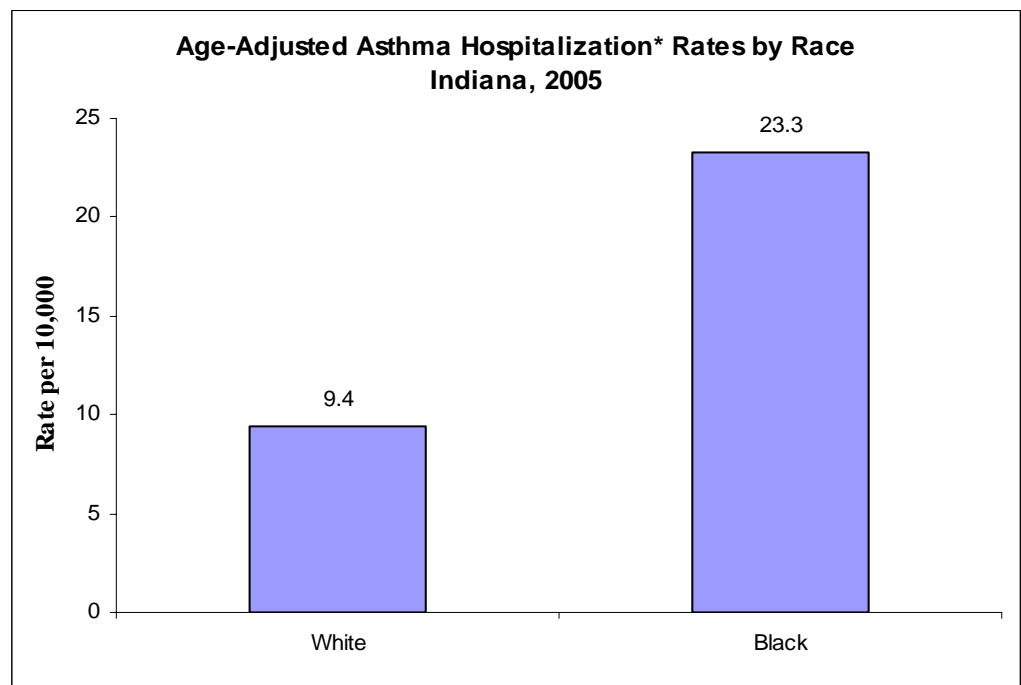
Of the 7,293 patients hospitalized due to asthma 72.6% were white, 17.2% were black and 10.2% were of other races. See Table-3.

**Table-3: Number and Percentage of Patients Hospitalized Due to Asthma by Race
Indiana, 2005**

Race	Frequency	%
White	5,299	72.6
Black	1,253	17.2
Other	741	10.2
Total	7,293	100

Due to the manner racial data are collected (hospital staff assign race for the patient) only the rates for blacks and whites are reported. The asthma hospitalization rate for blacks was more than two times higher than the rate for whites (23.3 per 10,000 and 9.4 per 10,000, respectively). See Chart-4.

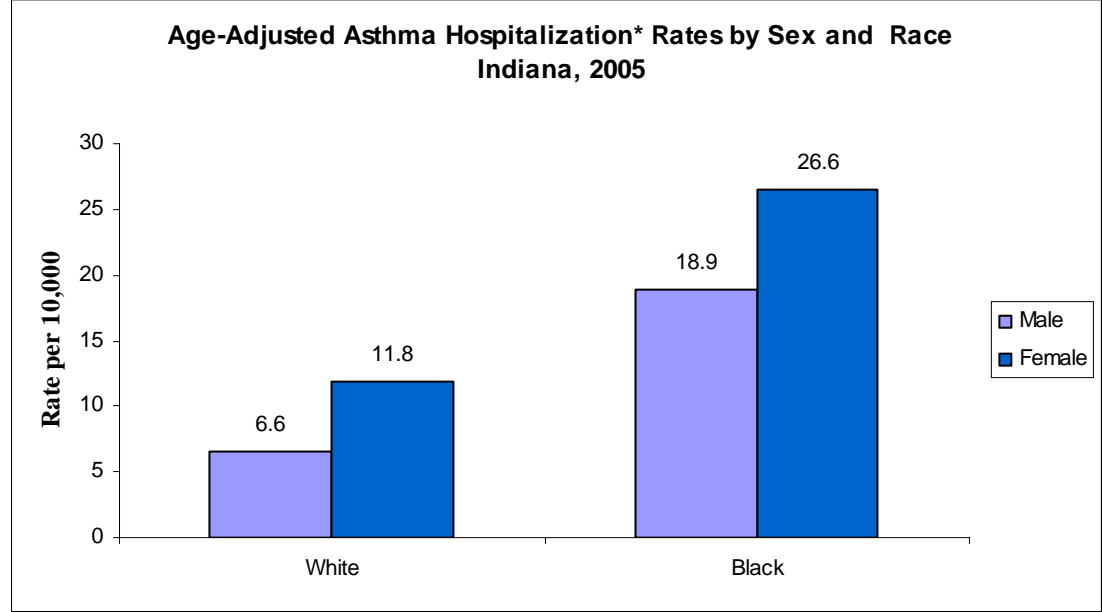
Chart-4



*Hospitalization rates equaled the number of unique patients identified per 10,000 Indiana population.

White and black females had the highest asthma hospitalization rates when compared to males of the same race. Black females had the highest hospitalization rate (26.6 per 10,000). See Chart -5.

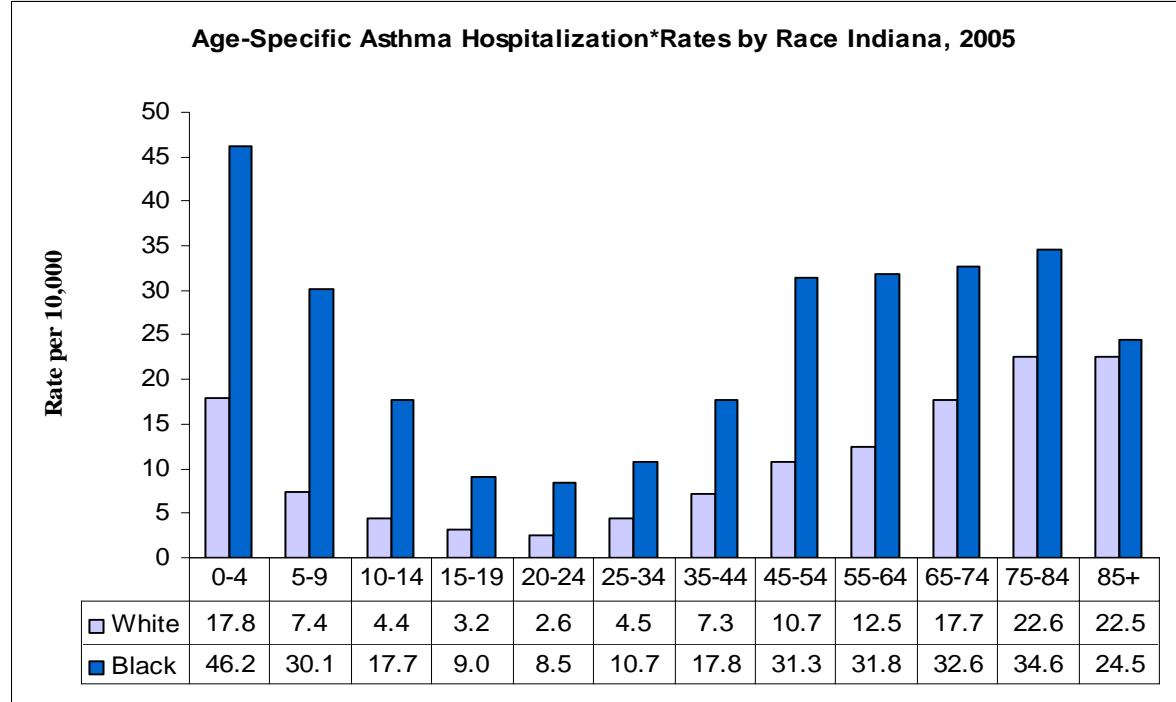
Chart-5



*Hospitalizations rates equaled the number of unique patients identified per 10,000 Indiana population.

Blacks had the highest asthma hospitalization rates regardless of age when compared to whites. See Chart-6. The rate for blacks was two to three times higher than whites for most age groups.

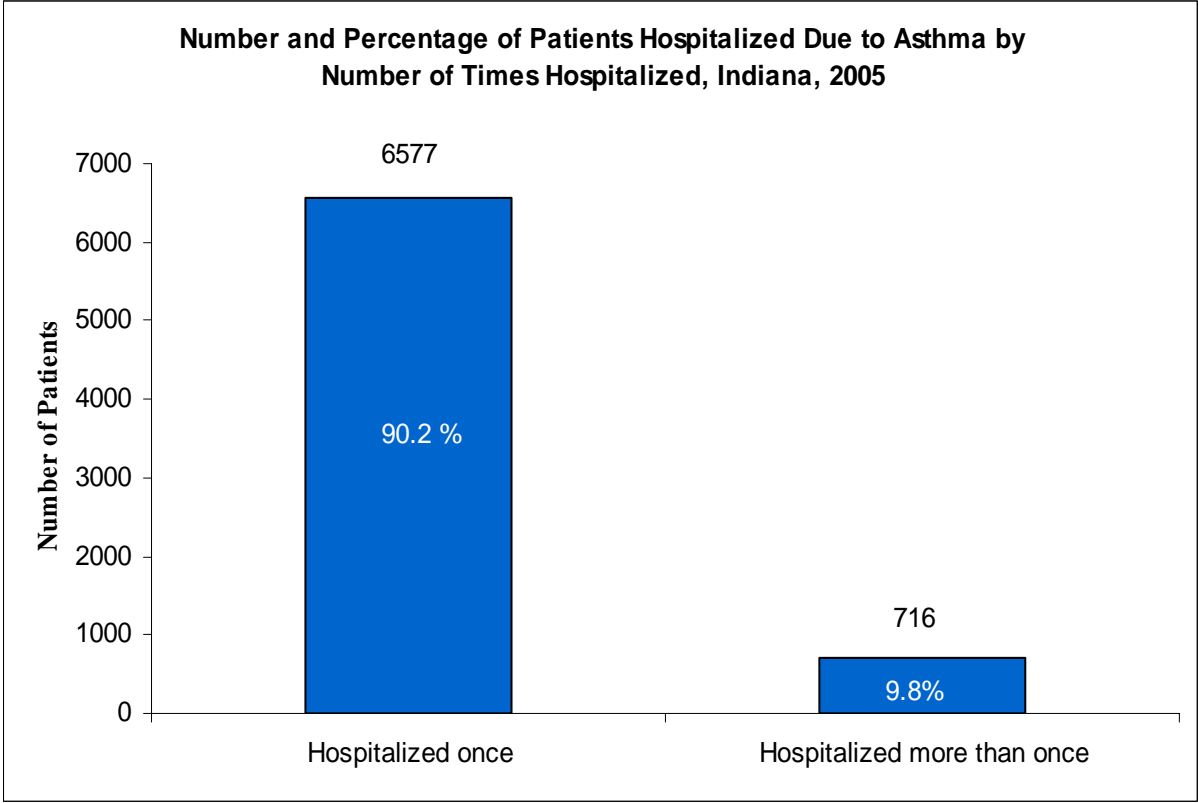
Chart-6



*Hospitalization rates equaled the number of unique patients identified per 10,000 Indiana population.

Of the estimated 7,293 patients hospitalized due to asthma, 90.2 % were hospitalized once and 9.8% were hospitalized more than once. See Chart-7. The age-adjusted asthma hospitalization rate was highest for patients hospitalized once when compared to patients hospitalized more than once (10.4 per 10,000 and 1.1 per 10,000, respectively).

Chart-7



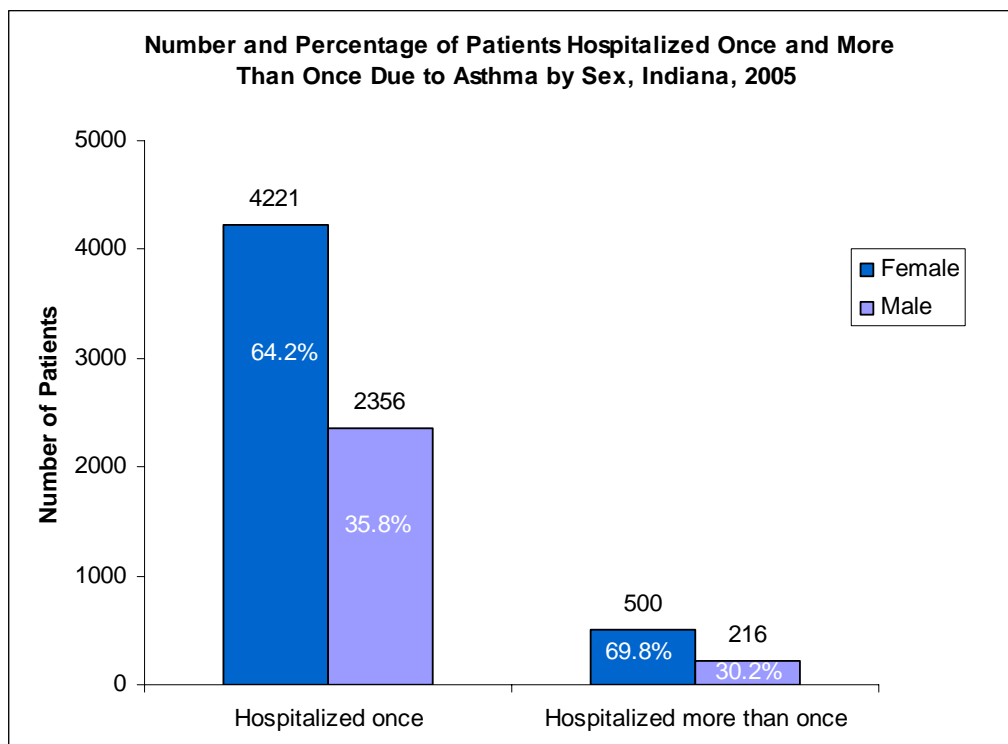
Of the 716 (9.8%) patients hospitalized two or more times due to asthma, the majority were hospitalized twice. See Table-4. However, some people were hospitalized from three times to 10 times.

Table-4: Number of Patients Hospitalized Due to Asthma by Number of Times Hospitalized Indiana, 2005

Number of Times Hospitalized	Number of Patients	%
1	6,577	90.18
2	542	7.43
3	109	1.49
4	37	0.51
5	15	0.21
6	5	0.07
7	6	0.08
9	1	0.01
10	1	0.01

Females were hospitalized approximately two times more due to asthma than males whether they were hospitalized once or more than once. See Chart-8.

Chart-8



More adults (18 years and older) than children (0-17 years) were hospitalized due to asthma, whether they were hospitalized once or more than once. See Chart-9. For patients hospitalized once due to asthma, there was not much difference between adults and children in the age-specific rate (10.3 and 11.1 per 10,000, respectively). This was also true for adults and children hospitalized more than once due to asthma (1.2 and 0.9, respectively).

Chart-9

